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Investigating the factors affecting outward FDI of Vietnam: Does political index matter?

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Abstract: Considering the important role of foreign direct investment (FDI) in economic growth and integration, this paper seeks to thoroughly analyze the outward FDI pattern of Vietnam to its 15 major FDI recipients (accounting for approximately 94% of Vietnam's OFDI) using the gravity theory and a robust panel data approach for the comprehensive annual data over the period of 2007 – 2022. By determining the main destinations of Vietnam's Outward FDI through the creation of social, economic, and political indices via the principle component analysis (PCA), the empirical results conclusively prove the positive impacts of the political index, social index, the existence of a common border, and accession to the WTO on the Vietnamese OFDI volume, while geographical distance is found to negatively impact the flow. As the main practical policy implications, issuing policies for sustainable economic growth, creating the novel strategy of FDI neighborhood policy, and fostering regionalism through FTAs (Free Trade agreements) are highly recommended.

Keywords: *Gravity theory; Outward FDI pattern; Principal component analysis.*

1. Introduction

In the context of integration, FDI plays an increasingly important role in Vietnam's economic development. As a country with a high economic openness, besides attracting FDI, Vietnamese enterprises are also increasingly concerned about enhancing their outbound investments to expand markets and improve their competitiveness. However, in reality, the OFDI (Outward Foreign Direct Investment) flow of Vietnamese enterprises has experienced many fluctuations and tends to decrease gradually. According to the World Investment Report (WIR 2024) by UNCTAD, global direct investment flows in 2023 reached USD 1.365 trillion, with a growth rate of 3%. However, OFDI flows from developing countries witnessed a 9% decrease in 2023. For Vietnam, OFDI flows also saw a significant decline, with registered capital in 2023 estimated at USD 421 million, a decrease of 21.2% compared to 2022. Besides the decline in newly registered capital, the recent OFDI activities of Vietnamese enterprises also reveal many limitations, such as capital withdrawal occurring in many projects, the average project scale tending to decrease, and the investment efficiency of many projects not being high. This is particularly evident in the losses of many OFDI projects carried out by state-owned enterprises (SOEs).

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Table 1.
Scale of OFDI Flows of Vietnamese enterprises.

Period	Number of projects	Total registered capital (million USD)	Average capital per project (million USD/project)
1999-2005	127	567,7	4,54
2006-2010	419	10447,2	24,93
2011-2019	1082	12073.6	11.16
2020-2023	444	1482	3.34

Source: Foreign investment agency, ministry of planning and investment.

Besides the introduction part, this study is organized as follows: A brief discussion on Vietnam's OFDI and literature review in section 2. Section 3 elaborates on methodology, data description and model specification. Next Section highlights the empirical estimation findings and lastly Section 5 represents the concluding remarks, some practical policy implications and recommendations for future research.

2. Literature Review

Globally, research on the factors affecting outward foreign direct investment (OFDI) flows has garnered significant attention from scholars. Studies on the macroeconomic factors influencing OFDI flows can be categorized into groups that utilize various models, such as the Eclectic theory, the Investment Development Path (IDP) model, and the Gravity model. The IDP model primarily examines how push factors from the investing country impact its OFDI flows. In contrast, the Eclectic theory considers factors influencing OFDI from both perspectives: push factors from the investing country and pull factors from the host country. The Gravity model, in addition to push and pull factors, also takes into account bilateral factors between the investing and host countries, such as geographical distance, trade volumes, and combined GDP. Noteworthy studies utilizing the gravity model. Tang et al. (2022) [1] investigated the impact of institutional distance, combined GDP, borders, bilateral exchange rates, and WTO membership on OFDI flows in developing countries. The authors assert that institutional distance and combined GDP positively influence these countries' OFDI flows. Yonghui Han et al. (2022) [2] studied the impact of sister city relationships between China and its partner countries on China's OFDI flows. The authors confirm that partnerships between sister cities, participation in the Belt and Road Initiative (BRI), and combined GDP all promote China's OFDI. Correa da Cunha et al. (2022) [3] examined how host country factors influence OFDI flows in Latin American and Caribbean countries. Using the entropy weighting method and the Gravity model, the study focused on institutional variables, infrastructure, technology, economic openness, and combined GDP. The authors assert that there is a positive relationship between macroeconomic efficiency, formal institutions, infrastructure, technology, and OFDI intensity. Strong formal institutions, along with the quality of infrastructure and technology, positively influence the relationship between macroeconomic efficiency and OFDI intensity. Meanwhile, Youxing Huang et al. (2024) [4] utilized dynamic spatial econometric methods to analyze the impact of sister city relationships on China's outward foreign direct investment (OFDI) using a linked national dataset from 2003 to 2016. The results show that sister city relationships play a significant and positive role in promoting China's OFDI. These relationships help mitigate risks, bridge gaps, and encourage various forms of OFDI, especially in countries involved in the Belt and Road Initiative. However, it is important to consider the potential neighborhood effect when China establishes sister city relationships with the neighboring countries of the host nation. Yiqing Xie et al. (2023) [5] studied the impact of geographical proximity and investment connectivity on the outward foreign direct investment (OFDI) decisions of Chinese multinational companies, including greenfield investments and cross-border mergers and acquisitions. The research team modeled the expansion of companies' OFDI with a lagged spatial structure and collected overseas FDI data from 3,479 Chinese multinational companies from 2002 to 2013, with investment destinations in

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over 160 countries. The results indicate that both geographical proximity and investment connectivity play crucial roles in promoting the OFDI of Chinese companies. Companies tend to prioritize investing in geographically proximate countries and those with strong investment connections to their current business activities. These network effects can help mitigate risks, facilitate cooperation, and promote the growth of China's OFDI. Additionally, Wei Tian (2024) [6] examined the impact of exchange rate fluctuations on the outward direct investment (ODI) of enterprises, considering the heterogeneous effects between distribution ODI and manufacturing ODI. Using extensive data on the ODI decisions of Chinese enterprises from 2000 to 2008, it was found that exchange rate fluctuations, particularly the depreciation of the domestic currency, tend to positively impact Chinese enterprises' ODI, primarily by promoting distribution ODI. Jingxia Zhang and Akihiro Ogura (2024) [7] analyzed the efficiency of China's outward foreign direct investment in ASEAN and the European Union (EU) using a stochastic frontier gravity model. The research found that the efficiency of China's investment in the EU15 remained stable from 2003 to 2020, while the investment efficiency in ASEAN and the EU13 declined. In ASEAN, factors such as higher economic freedom positively impact the efficiency of China's investment, whereas infrastructure opportunities negatively impact it. Economic distance positively affects China's investment in EU countries, especially in the EU15. However, higher economic freedom enhances global competition, limiting China's direct investment, particularly in the EU13. EU's updated infrastructure and investment agreements facilitate China's investment, while the "Belt and Road Initiative" has a limited impact. Unggul Heriqbaldi and Naufira Deilya Mufiidah (2023) [8] examined the factors influencing China's outward foreign direct investment (OFDI) in ASEAN economies using the Kao panel cointegration method and the panel ARDL model to estimate the long-term and short-term impacts of relationships between variables during the period 2003-2019. The results show that, in the long term, ASEAN market size, exchange rates, import-export levels between China and ASEAN countries, and institutional factors such as the control of corruption index and political stability positively affect China's OFDI flows into ASEAN economies, while inflation rates have a negative impact on OFDI. Furthermore, Thu-Ha Thi An and Kuo-Chun-yeh (2023) [9] studied the economic and institutional factors determining Taiwan's outward direct investment (ODI) in six Southeast Asian countries from 1998 to 2017, applying the ARDL–Pooled Mean Group estimation. The research indicates that local economic factors are the main determinants in the long term. Close trade relations and historical ties with Southeast Asia have a long-term positive impact. Conversely, the quality of the host country's institutions has a strong positive impact in both the long and short terms. Lin Chen and Chen Cheng (2023) [10] used cross-sectional data from 111 destination countries related to China to examine whether institutional quality matters for the relationship between Chinese migration waves and outward foreign direct investment (FDI) in destination countries. The empirical results demonstrate that institutional quality amplifies the positive impact of Chinese migration on outward FDI, even after accounting for potential endogeneity using an instrumental variable approach with 2SLS estimation. Specifically, political stability and the absence of violence/terrorism, government effectiveness, the rule of law, and control of corruption positively moderate the relationship between migration and FDI. Leena Ajit Kaushal (2022) [11] utilized the PPML model to explore the key determinants of India's outward foreign direct investment (OFDI) in 26 developed and 81 developing countries by integrating a nuanced perspective on institutional distance with conventional location factors, using data from 2008 to 2018. The study found that asset augmentation and market-seeking motives are the primary drivers of OFDI in both developed and developing regions. Overall, the institutional environment demonstrated a positive link between India's OFDI and the strong governance quality of the host country (excluding RS investments in the developing region). However, only strong regulatory quality (RQ) and control of corruption (CC) were key IQ determinants significantly attracting OFDI in developed countries. Surprisingly, no World Governance Indicators (WGI) significantly drove OFDI in developing countries. However, interaction effects revealed that only market-seeking investors from India are attracted to well-regulated (RQ) and rule-based (RL) developing countries. Yanfeng Liu et al. (2022) [12] used a vector error correction model along with

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panel data collected from 2007 to 2019 to evaluate the contribution of system location determinants, including four economic, logistical, energy, and political factors, to China's OFDI. The research found that China's OFDI in both coastal and landlocked countries is statistically sensitive to economic, energy, logistical, and political variables in the Belt and Road Initiative (BRI) participating host countries. Moreover, the results indicate that improving logistical infrastructure and the political investment environment in landlocked countries can positively attract China's OFDI. Penghua Qiao et al. (2024) [13] based their study on localization and dynamic capability theories, using a dataset of 562 Chinese small and medium-sized enterprises (SMEs) from 2011 to 2020, to examine how digitization facilitates SMEs' OFDI in developing countries. The study found that the digitization of SMEs positively impacts their OFDI level, measured by both the number of overseas subsidiaries and the number of host countries. This effect is mediated by a company's dynamic capabilities and moderated by the senior managers' international experience and industry competition intensity. Yuandan Liu et al. (2024) [14] focused their research on how government subsidies, in the form of financial support, affect the OFDI of private enterprises. Using microdata from the CSMAR database, which includes listed private companies from 2013 to 2017, the empirical results of this study show that government subsidies positively promote the OFDI of private enterprises. Furthermore, financial constraints have a negative impact on OFDI, but government subsidies mitigate this effect. Additionally, the results indicate that the impact of government subsidies on the OFDI of private enterprises varies depending on the degree of marketization. Yufeng Chen et al. (2024) [15] studied the determinants of location choice for China's direct energy investment in BRI countries. The paper also attempts to analyze the impact of the Belt and Road Initiative (BRI) on the effect of national distance. For this purpose, the research team applied the gravity model to data from 2003 to 2017. The main findings show that economic distance, geographical distance, and institutional distance hinder the location choice of China's OFDI in the energy sector, but the impact of cultural distance remains uncertain. Additionally, the Belt and Road Initiative has increased China's direct energy investment in BRI countries but has not significantly altered the effect of national distance on location choice. Furthermore, the results show that renewable energy is attracting investment from Chinese companies into developed countries. Yishuang Liu et al. (2024) [16] explored the domestic environmental impacts of outward foreign direct investment (OFDI) activities, using panel data from 222 Chinese cities from 2007 to 2019. The research team obtained the following results: (1) For every 1% increase in OFDI flows, the overall domestic environmental quality can improve by 1.55%. (2) The domestic environmental effect varies among cities due to regional economic factors, being more pronounced in eastern regions, highly industrialized cities, and cities with better business conditions. (3) Although there is a spatial relationship between cities, there is no clear evidence supporting the phenomenon of spatial spillover. Domestic environmental quality is mainly improved through the OFDI activities of the city itself. Yanfeng Liu et al. (2024) [17] analyzed the impact of energy factors on the location determinants of OFDI in China to help reduce energy dependence and improve China's energy security. Simultaneous equation models and panel data from 162 target countries over the period 2005–2020 were used to examine the coincidental relationship between volatile and non-volatile energy and intermediary factors in target investment countries and China's energy OFDI. The research team employed a simultaneous equation model, which includes a system of equations, constituting a multifaceted modeling approach that allows for the examination of two or more dependent variables. Fang Chen and Wenya Sun (2023) [18] conducted an empirical analysis on how carbon emission efficiency affects the OFDI of companies by using a Probit model and OFDI data of Chinese A-share listed companies, and matching carbon emission efficiency data with the cities where the listed companies are located, from 2007 to 2019. The findings of this study revealed that carbon emission efficiency increases the likelihood of OFDI and significantly expands the scale of OFDI by reducing financial costs and improving technological innovation, with regression results being positively significant at the 1% level. The research team's heterogeneity analysis indicated that the role of carbon efficiency in promoting OFDI is more prominent for state-owned enterprises, large companies, clean companies, and companies in competitive markets. Additionally, financial development

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can positively regulate the impact of carbon emission efficiency on OFDI, and carbon emission efficiency deepens the market engagement of investment compared to the level of diversification of the company's OFDI market. Ryan W. Tang and Peter J. Buckley (2022) [1] investigated how emerging market multinational enterprises (EMNEs) choose locations for foreign direct investment (FDI) and how they determine the scale of FDI in host countries where formal institutions are more or less developed than their home country. The research team hypothesized that the likelihood of positive (negative) investment by EMNEs decreases (increases) as the institutional distance between the home and host country increases, but the investment scale increases (decreases) with increasing institutional distance. FDI location choices vary among EMNEs with different levels of intangible assets, but the scale of FDI does not. The report's analysis of 3,297 outward FDI by EMNEs in 100 host countries from 2004 to 2019 provides supportive evidence. This study extends internalization theory by using specific evidence from EMNEs on the orientation of institutional distance between the home and host country. Muhammad Akhtaruzzaman (2023) [19] utilized a gravity model to uncover that a high level of capital account openness (a factor ensuring investor returns) weakens the negative impact of poor institutional quality in host countries on South Korea's OFDI. Yanfeng Liu and colleagues (2023) [20] used a vector error correction model (VECM) to conduct an empirical analysis on the impact of the target country's investment environment on the location determinants of OFDI, using China and the United States as examples, focusing on 172 countries from 2005 to 2019. The results showed significant differences in the theoretical framework of foreign investment between China and the United States. For China, investment environment factors such as energy, logistics infrastructure, and politics were found to be the main drivers of China's OFDI. However, the OFDI of the United States was driven by corporate behavior aiming at economic benefits. Wei Qianqing and Shi Qingyun (2024) [21] applied the PCA method to measure the level of digital economy in host countries across five indicators, including fixed-line telephone coverage, fixed broadband coverage, Internet user rate, university education rate, and mobile phone coverage. Measurement results indicated a large gap in the level of digital economy among RCEP host countries, with an average value being negative. Based on panel data from 14 RCEP countries from 2003 to 2022, this paper incorporated comprehensive digital economy indicators into the gravity model and concluded that the digital economy level of RCEP host countries significantly promotes the development of China's OFDI through the two-way fixed effects estimation method. Yong-Jie Gui et al. (2023) [22] analyzed the impact of investment facilitation levels in 11 RCEP countries (excluding Myanmar, Brunei, and Laos due to lack of data) on China's outward foreign direct investment (OFDI) using balanced panel data from 2010 to 2019. Regression analysis results showed that investment facilitation levels had the greatest impact on China's OFDI, with all four primary indicators having a positive impact on China's OFDI, and among them, the institutional environment had the greatest impact. Additionally, the study found that explanatory variables such as market size, population, geographical distance, openness level, natural resources, and whether a valid bilateral investment treaty was signed would positively affect China's OFDI, while tax rates and APEC membership would somewhat hinder China's OFDI. Rishika Nayyar et al. (2022) [23] examined the role of institutional distance as a determinant of India's outward foreign direct investment (OFDI). The study combined a nuanced perspective on institutional distance with traditional location factors to analyze India's OFDI flows into developed and emerging economies (EE) from 2009 to 2017. The study found that India's OFDI was not influenced by mimetic pressures caused by institutional distance regulations and norms, but perceived institutional distance acted as a deterrent in developed economies. Indian multinational companies engaged in institutional arbitrage when they simultaneously engaged in institutional escapism and exploitation strategies. Igor Drapkin and colleagues (2022) [24] focused on the impact of institutional quality on outward foreign direct investment (OFDI). To estimate this empirically, the research team utilized a dataset encompassing 102 home countries and 67 host countries from 2001 to 2016. Employing gravity models and applying the maximum likelihood Poisson approach to address issues of zero observations, the authors integrated a set of institutional variables in each country into a single institutional index using principal component analysis. The study affirmed the

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positive influence of institutional development on FDI flows in institutionally developing countries. Moreover, an increase in institutional quality was found to stimulate horizontal rather than vertical FDI flows in the economy. Finally, institutional distance negatively impacted FDI levels only when the institutional distance between two major countries was significant. The policy implications of this study are highly beneficial for further development organizations. Raphael Chiappini and François Viaud (2021) [25] used the gravity model of FDI attraction for 30 host countries during the period 2005–2017, employing the maximum likelihood Poisson to address the issue of zero values. The results indicated that Japan's outward foreign direct investment (OFDI) was driven not only by traditional factors such as market size, real exchange rate of the Yen, trade openness, perceptions of corruption, and financial instability but also by industry-specific characteristics. Bhanu K.V. Murthy (2015) [26] examined the impact of economic development on OFDI from developing countries using a range of socio-economic variables. Using principal component analysis, a composite set of six indices—human resources, infrastructure, labor, market, trade openness, and resources—was constructed as determinants of OFDI. Panel regression methods were employed for both stock and flow of OFDI. The study period spanned from 1990 to 2009. Experimental results indicated that outward flows of FDI from these developing countries did not significantly increase. However, in terms of growth, the top ten countries showed a significant annual growth rate of 8%. Infrastructure was the only variable with a slightly higher than unity elasticity in the case of the top ten countries and was highly significant. Thus, FDI flows out of these developing countries with significant infrastructure are important. Niti Bhasin and Vandana Jain (2013) [27] examined host country factors determining outward FDI in ten selected economies in the region. Using panel data from 1991 to 2010, this article modeled the role of host country "push" factors in driving outward FDI. A fixed-effects model (Least Squares Dummy Variables (LSDV)) was developed to capture market conditions, policy variables, economic variables, and production factors. Principal component analysis was also used to enhance the richness of the model's analysis. The results indicated that GDP and FDI openness were important factors in the host country influencing outward FDI. Countries with higher GDP and more liberal and open FDI policies tended to have larger outflows of FDI ([28]). Ma Degong et al. (2023) [29] conducted a study to identify the macroeconomic factors determining China's outward foreign direct investment (OFDI) into Pakistan from 1990 to 2017, with a particular focus on the China-Pakistan Economic Corridor (CPEC). The research findings indicate that exchange rates, inflation, and corruption have a negative and statistically significant impact on China's OFDI. The legal and order situation did not show a significant relationship with China's OFDI. The error correction term is negative and highly significant, suggesting that short-term imbalances can be adjusted at a rate of 10%. Short-term analysis reveals that corruption, inflation, and law and order significantly affect China's OFDI, while exports do not have a significant impact in the short term. Hongzhong Fan et al. (2024) [30] investigated the impact of financial technology (Fintech) on the OFDI decisions of Chinese companies. The results indicate that the development of regional Fintech significantly promotes the OFDI of Chinese companies. Kai Liu et al. (2023) [31] conducted a study utilizing China's National Directory of Foreign Investment-Oriented Industries (NDFC) as a policy shock to analyze the impact of OFDI encouragement policies on firm performance and external effects. The results show that OFDI encouragement policies positively affect the operational efficiency of firms engaging in OFDI. This effect is demonstrated through higher post-investment return on sales (ROS), labor productivity, and fixed asset efficiency (FPE). Tong Tong et al. (2023) [32] carried out a study to identify the primary drivers of China's outward direct investment (ODI) decisions from 2003 to 2012. Using panel data covering 176 host countries, the findings reveal that market size, trade variables, and natural resource variables are closely related to China's ODI stock. The study concludes that market size, natural resources, and China's export activities to host countries positively influence China's ODI stock. Yuandan Liu et al. (2024) [14] focus on how government subsidies, as a form of financial support, affect the outward foreign direct investment (OFDI) of private enterprises. Using micro-data from the CSMAR database covering private listed companies from 2013 to 2017, this empirical study reveals that government subsidies positively promote OFDI of private

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enterprises. Moreover, financing constraints have an adverse effect on OFDI, but government subsidies help mitigate this effect. Furthermore, the results indicate that the impact of government subsidies on private enterprises' OFDI varies depending on the degree of marketization. Youxing Huang, Yu Yang (2023) [33] use an original and unique project-level panel dataset from 2005 to 2018, this study explores the determinants of OFDI location decisions and entry failure risk in the overseas energy sector undertaken by Chinese enterprises. The results demonstrate strong evidence that the Chinese public diplomacy endeavors stimulate energy OFDI decisions conducted by Chinese firms in terms of both investment tendency and magnitude. By contrast, most macroeconomic features of host countries are not verified as determinants of energy OFDI. Penghua Qiao et al. (2024) [13] examine how digitalization facilitates OFDI by SMEs in emerging countries, building on the internalization and dynamic capabilities theories, this paper. Using a dataset of 562 Chinese SMEs from 2011 to 2020, we find that SMEs' digitalization has a positive impact on their OFDI levels, measured using both the number of overseas subsidiaries and the number of host countries. This effect is mediated by a firm's dynamic capability and moderated by top managers' international experience and industry competitive intensity. Xiang Cai et al. (2023) [34] systematically examine how China's OFDI exerts its influence on green technology spillovers, based on 56 B&R countries' 2003–2019 panel data. This study makes three significant findings: Firstly, China's OFDI has positive asymmetric characteristics in promoting green technology spillovers to host countries mentioned, which have lower income levels and openness. Secondly, strict relative environmental regulation can act as a "pressure pool" significantly enhancing the "green halo effect"; Thirdly, China's OFDI can help host countries obtain more green technology spillovers through three channels: expanding host countries' economic scale, upgrading host countries' industrial structure, and suppressing host countries' use of non-renewable energy. These findings point the way for 56 host countries to better access green technology spillovers. Yufeng Chen et al. (2023) [15] aim to study the determinants of location choice of China's direct energy investment in BRI countries. It also attempts to analyze the impact of the Belt and Road Initiative on the effect of national distance. For this purpose, the gravity model is applied to the data over the period 2003–2017. The main results show that economic distance, geographical distance, and institutional distance hinder the location choice of China's OFDI in the energy sector, but the effect of cultural distance is uncertain [35].

Thus, it can be seen that scholars around the world have studied the factors influencing OFDI from various perspectives, both from the push and pull factors as well as bilateral factors (gravity model). Meanwhile, studies in Vietnam on OFDI are still in the initial stages, lacking systematic studies and mainly applying IDP models to evaluate the push factors affecting Vietnamese OFDI activities.

3. Methodology

In order to evaluate the OFDI pattern of Vietnam, the gravity theory proposed by Tinbergen (1962) and developed by a large number of scholars (e.g. Yanfeng Liu, Xue Li, Xiaonan Zhu, Min-Kyu Lee & Po-Lin Lai, 2023; Yong-Jie Gui, Jin-Gu Kang, Yoon-Say Jeong, 2023; Nguyen, 2023 [36]), is employed. The majority use the theory of gravity, which has its origins in physics, in the field of bilateral trade between the two countries. This theory in bilateral trade assumes that the volume of trade between two countries will be directly related to the size of their national economy and inversely related to the geographical distance between them. In recent years, some studies (e.g. Yufeng Chen et al (2024); Igor Drapkin et al (2022); Igor Drapkin et al (2022)) have used this concept and definition in bilateral foreign direct investment between the two countries. Mathematically, the basic gravity model of outward FDI from country i to a partner country j can be written as Eq.1:

$$OFDI_{ij} = \frac{GDP_i * GDP_j}{Dis_{ij}} \quad (1)$$

Where OFDI denotes outward FDI from country i to country j, while GDP and dis present economic size of country and geographical distance between countries i and j. Based on the existing

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literature (e.g. Muhammad Akhtaruzzaman (2023), [19]) who have determined the influencing factors on the volume of outward FDI, the research model is proposed as follows:

$$OFDI_{ijt} = \alpha + \alpha_1(GDP_i * GDP_j) + \alpha_2(Ecoin_{ijt}) + \alpha_3(Poin_{ijt}) + \alpha_4(Soin_{ijt}) + \alpha_5(DIS_{ijt}) + \alpha_6(BORDER) + \alpha_7(WTO) + \varepsilon_{it} \quad (2)$$

Where Ecoin, Poin and Soin represent economic index, political index and social index for countries, respectively, while Border and WTO are two dummy variables showing the existence of a common geographical border between countries and membership in the World Trade Organization, respectively. Moreover, the data for this study was gathered annually from 2007 to 2022 for the OFDI flow from Vietnam to the major FDI recipients. The main reason to select the beginning year of 2007 is the highlighted point of Vietnam's accession to the WTO. The year of 2007 is the unique step of Vietnam in the way of globalization and economic openness. In addition, we transform all the variables in Eq.2 into logarithmic form to lower the presence of heteroscedasticity and make the slope coefficients into elasticity (Rahman and Alam, 2021).

To construct the indexes (economic, political and social), the technique of PCA (Principle Components Analysis) was employed. In general, the variables of our model are as listed in Table 2.

Table 2.
Data description.

Variable	Index	Unit	Definition	Source
GDP	-	Current US$	Gross Domestic Product at time t	World Bank (https://data.worldbank.org/)
DIS	-	Kilometers	Geographical distance between two countries at time t	The Centre dÉtudes Prospectives et d'Informations internationales(CEPII) (http://www.cepii.fr/cepii/en)
BORDER	-	0.1	The dummy variable, takes 1 if there is a common border between countries i and j, otherwise takes 0	World Bank Maps (https://maps.worldbank.org/)
WTO	-	0.1	The dummy variable, captures 1 for all the years of membership in the WTO, and takes 0 for the rest years.	WTO (https://www.wto.org/english/)
OFDI	-	Million US $	Outward FDI from Vietnam to its top partners at time t	Ministry of Planning and Investment portal (www.mpi.gov.vn)
Inflation rate	Economic index	%	General level of commodities' prices in partner country j at time t	World Bank (https://data.worldbank.org/)
Bilateral exchange rate		-	Vietnamese dong/ national currency of partner country j at time t	Calculation from the data of World Bank (https://data.worldbank.org/)

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Employment rate		%	% of total labor force in partner country j at time t	World Bank (https://data.worldbank.org/)
COR	Political index	-	Control of corruption in partner country j at time t	World Governance Indicators, World Bank (https://databank.worldbank.org/source/worldwide-governance-indicators)
ROL		-	Rule of law in partner country j at time t	World Governance Indicators, World Bank (https://databank.worldbank.org/source/worldwide-governance-indicators)
RQ		-	Regulatory quality in partner country j at time t	World Governance Indicators, World Bank (https://databank.worldbank.org/source/worldwide-governance-indicators)
GE		-	Government effectiveness in partner country j at time t	World Governance Indicators, World Bank (https://databank.worldbank.org/source/worldwide-governance-indicators)
URB	Social index	%	Urbanization growth in partner country j at time t	World Bank (https://data.worldbank.org/)
POV		% of population	Poverty headcount ratio at national poverty lines in partner country j at time t	World Bank (https://data.worldbank.org/)
DR		% of working-age population	Age dependency ratio	World Bank (https://data.worldbank.org/)

The results of employing the PCA technique which transform the aforementioned variables in Table 2 to an equal number of principal components of economic, political and social indexes, are represented in Table 3 as follows:

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Table 3.
Principal component analysis technique.

Index	Number	Value	Proportion	Cumulative values	Cumulative proportion
Economic	1	1.65	0.55	1.65	0.55
	2	0.84	0.28	2.49	0.83
	3	0.51	0.17	3.00	1.000
Political	1	1.84	0.46	1.84	0.46
	2	0.92	0.23	2.76	0.69
	3	0.58	0.145	3.34	0.835
	4	0.66	0.165	4.00	1.000
Social	1	1.12	0.373	1.12	0.373
	2	0.63	0.21	1.75	0.583
	3	1.25	0.417	3	1.000

To evaluate the factors affecting the OFDI of Vietnam, the authors collect the data from top 15 OFDI host countries in the period 2007-2022. These 15 countries accounted for 93.9% of total OFDI capital of Vietnam during the 2007-2022 period. Therefore, the research results are valuable in determining the factors affecting the OFDI of Vietnam into the main host countries.

Table 4.
Top 15 host countries of Vietnam's OFDI.

Unit: Million USD, %		
Nation	**Registered capital**	**Proportion of Vietnam's total OFDI**
Laos	5362.4	24.62%
Cambodia	2943.3	13.52%
Venezuela	1825.1	8.38%
Russia	1630.0	7.48%
Myanmar	1470.6	6.75%
Peru	1276.7	5.86%
Algeria	1261.5	5.79%
USA	1261.1	5.79%
Malaysia	854.0	3.92%
Australia	592.4	2.72%
Singapore	582.6	2.68%
Tanzania	356.3	1.64%
Mozambique	345.9	1.59%
Germany	283.3	1.30%
Cameroon	230.7	1.06%

4. Results and Discussion

4.1. Results

To find out the appropriate panel estimator, some required pre-tests should be done. Firstly three panel unit root tests, namely Levin, Li & Chu (LLC), ADF-Fisher and Philips-Perron-Fisher tests were conducted for all variables (except dummy ones) at levels and first differences. The results of these panel unit tests are reported in Table 5:

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Table 5.
Panel unit root test findings.

Variable	LLC	ADF-Fisher	PP-Fisher	Stationary
LOFDI	-0.12 [0.32]	21.22 [0.12]	16.05[0.66]	No
D(LOFDI)	-16.86[0.00]	121.18[0.00]	155.82[0.00]	Yes
LGDP	-0.54[0.19]	4.77[0.34]	8.37[0.34]	No
D(LGDP)	-46.55[0.00]	121.68[0.00]	112.42[0.00]	Yes
LECOIN	-0.21[0.34]	5.87[0.53]	4.73[0.43]	No
D(LECOIN)	-231.65[0.00]	112.35[0.00]	153.26[0.00]	Yes
LPOIN	1.08[0.67]	6.98[1.09]	5.72[0.15]	No
D(LPOIN)	-12.46[0.00]	165.43[0.00]	265.48[0.00]	Yes
LSOIN	-0.82[0.24]	33.67[0.49]	12.86[0.25]	No
D(LSOIN)	-14.41[0.00]	165.52[0.00]	138.44[0.00]	Yes

Note: Numbers in brackets indicate p-values
LOFDI, LGDP, LECOIN, LPOIN and LSOIN indicate logarithm of outward FD I from Vietnam, logarithm of GDP, logarithm of economic index, logarithm of political index and logarithm of social index, respectively.

The results of panel unit root tests prove that all the variables of our model are non-stationary at levels and become stationary at their first difference. The empirical estimation to evaluate the signs and magnitudes of the long-run coefficients can be done through the FMOLS estimator. Table 6 reports the results of the estimation as bellows:

Table 6.
FMOLS estimation results.

Dependent variable	Explanatory variable	Coefficient	p-value
OFDI	Joint GDP	0.012	0.00
	Geographical distance	-0.23	0.00
	Economic index	0.19	0.17
	Political index	0.48	0.01
	Social index	0.26	0.00
	Common border (BORDER)	0.15	0.03
	WTO Accession (WTO)	0.09	0.03

Based on the estimated coefficients, the size of joint GDP, used as an indicator of economic scale, significantly and positively influences Vietnam's OFDI towards its main destinations. A 1% increase in joint GDP could potentially lead to a nearly 0.012% increase in FDI from Vietnam to these countries. Conversely, the coefficient related to geographical distance between Vietnam and its partner countries shows a negative correlation, indicating that Vietnam tends to prefer nearby countries for OFDI. Regarding the economic index, although the coefficient was positive, it was not statistically significant. This suggests that variables such as inflation rate, employment rate, and bilateral exchange rate, which form the economic index, do not appear to have a substantial impact on either boosting or reducing Vietnam's OFDI to its main destinations. In contrast, the political index shows a significant positive effect: a 1% increase in this index may lead to approximately a 0.48% increase in Vietnam's OFDI to partner countries. This underscores the importance of political stability and improvements in factors like control of corruption, rule of law, regulatory quality, and government effectiveness in both Vietnam and its main OFDI destinations. Regarding the social index, which includes metrics like poverty rates, dependency ratio, and urbanization growth, its impact is positive and statistically significant. A 1% increase in this index could potentially increase Vietnam's OFDI to its main destinations by around 0.26%. Furthermore, analyzing membership in the WTO as a proxy for globalization and having a common border as a proxy for a neighborhood policy for FDI, it appears that the neighborhood policy

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(common border) has a more significant impact on Vietnam's promotion of OFDI compared to globalization (WTO accession). In summary, these findings highlight the multifaceted factors influencing Vietnam's outward FDI, ranging from economic size and geographical proximity to political stability and social indicators, as well as the strategic implications of globalization and regional policies.

5. Conclusion

The FMOLS model results indicate that political index, social index, joint GDP, and shared borders positively impact Vietnam's outward FDI to major destinations. Additionally, economic integration and openness, as signified by WTO accession, also positively influence Vietnam's OFDI. However, distance negatively affects these capital flows. In practice, Vietnam's OFDI tends to focus on neighboring countries such as Laos, Cambodia, and Myanmar, which are among the top five recipients of Vietnamese outward FDI.

Conversely, factors such as inflation, unemployment, and bilateral exchange rates, represented by the economic index, do not significantly promote Vietnam's OFDI flows. This is largely because, during the study period, Vietnam's OFDI was predominantly driven by state-owned enterprises with political objectives, making economic factors less influential in investment decisions. To boost Vietnam's OFDI in the future, priority should be given to investing in countries with a large proportion of working-age populations and high urbanization levels.

Vietnam should also implement policies that encourage investment in neighboring countries, such as Laos, Cambodia, and others within the ASEAN region. Moreover, Vietnam must enhance integration efforts and leverage the benefits of FTAs to expand its OFDI in partner countries. Additionally, Vietnamese authorities should closely monitor the investment efficiency of projects, particularly those undertaken by state-owned enterprises.

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